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University Hospitals Birmingham NHS
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Guidance on the Administration of Intravenous Cyclophosphamide Infusions by Registered Nurses for the Treatment of Vasculitis

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AFFIX PATIENT LABEL
NAME

DOB

HOSPITAL NUMBER

GUIDANCE FOR THE ADMINISTRATION OF INTRAVENOUS CYCLOPHOSPHAMIDE INFUSIONS BY REGISTERED NURSES FOR THE TREATMENT OF VASCULITIS

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Guidance on the administration of intravenous Cyclophosphamide Infusions by Registered nurses for the treatment of Vasculitis.

To be used in conjunction with Trust Medicines Policy and associated procedures, Procedure for Safe Prescription, Handling and Administration of Cytotoxic and other Chemotherapeutic Agents and Expanded Practice Protocol for the Administration of Intravenous Drugs and Infusions by Registered Practitioners

Intravenous Cyclophosphamide infusion is used to treat patients with severe life or organ threatening Vasculitis in conjunction with tapering dose oral corticosteroids. Plasma exchange and/or pulse intravenous corticosteroid may also be used at diagnosis at the discretion of the treating Consultant.
Cyclophosphamide must be given on weeks 0, 2, 4, 7, 10 and 13. After week 13 (the sixth dose), a decision will be made by the consultant responsible for the patient whether disease remission has been achieved or whether further infusions are required. The maximum total infusions is usually ten (given at weeks 16, 19, 22 and 25).

Adjuvant medications:

- Co-trimoxazole 480mg orally every other day is usually prescribed as PJP Pneumonia prophylaxis for the duration of Cyclophosphamide therapy.
- Gastro-protection (usually Ranitidine 150mg twice daily) is given whilst the patient receiving high dose steroid treatment.
- Prophylactic anti-fungal treatment is **not** routinely prescribed.
- Mesna is given as bladder protection, 400mg orally two hours before, two hours after and six hours after Cyclophosphamide infusion.
- Ondansetron 8mg orally is given 2 hours prior to Cyclophosphamide infusion and repeated 12 hours after infusion to prevent nausea and vomiting.

Cyclophosphamide prescribing:

Prescribing is restricted to Renal Consultants.

Patients attending as a day case must have a day case admission on the Prescribing, Information & Communication System (PICS).

Dosing:

Age	Creatinine <300 µmol/L	Creatinine >300 µmol/L
<60	15 mg/kg	12.5 mg/kg
60-70	12.5 mg/kg	10 mg/kg
>70	10 mg/kg	7.5 mg/kg

Infusions must be administered on weeks 0, 2, 4, 7, 10 & 13. Further infusions at weeks 16, 19, 22, & 25 may be given at consultant's discretion. Infusions may be deferred at doctor's discretion due to infection or low white cell count. Subsequent infusions must continue at 2-3

weekly intervals after the delayed infusion. Further dose reductions may be necessary due to previous low white cell/neutrophil counts or at consultant's discretion.

See prescribing guidance on renal unit for further information.

The Planned Treatment Schedule on page 7 must be completed**.**

Pre/Post Infusion drugs:

The prescribing of drugs required pre/ post infusion must take place at the time of prescribing the Cyclophosphamide Infusion. For any ambulatory patients the Mesna and Ondansetron should be prescribed on PICS and printed to Pharmacy Out-patients Dispensary so that patients can collect the medications to take at home.

Mesna

Three doses of Mesna are given orally with each IV pulse to reduce bladder toxicity from cyclophosphamide.

- **1st dose:** Mesna 400mg tablet 2 hours before the start of the cyclophosphamide infusion. If this has not been taken by patient prior to admission this must be taken on arrival and the infusion commenced without delay.
- **2nd dose:** Mesna 400mg 2 hours after the start of the infusion.
- **3rd dose:** Mesna 400mg 6 hours after the start of the infusion

Ondansetron

Prophylaxis against nausea is recommended.

- Ondansetron tablet 8mg should be taken at least 30 minutes before the start of the infusion. This can be taken with pre infusion Mesna.

- If required, a further Ondansetron 8mg tablet may be taken 12 hours after the first dose or before the patient retires to bed.

- Patients experiencing significant nausea/vomiting despite oral Ondansetron may receive intravenous Ondansetron instead of oral Ondansetron before Cyclophosphamide infusion. Extended treatment with oral Ondansetron can be given for those patients experiencing protracted nausea/vomiting following treatment with Cyclophosphamide.

Patients must receive a discharge leaflet containing details of when to take their next doses of Mesna and Ondansetron (Appendix 1)

Consultant responsibilities prior to treatment with Cyclophosphamide

- Ensure that the prescription of Cyclophosphamide is appropriate for the patient.
- Ensure that the patient has received appropriate information regarding risks and benefits of treatment with Cyclophosphamide including fertility and contraception advice (Arthritis Research UK Cyclophosphamide leaflet to be given to patient).
- Written consent obtained using UHB Renal Cyclophosphamide consent form and patient received copy for their own records. Consent form to be scanned to portal.
- Ensure patient has verbally consented to and been screened for Hepatitis B/C and HIV status.
- Varicella Zoster IgG status to be confirmed if not already known. Where VZV IgG status has not been checked previously, this should be sent when patient attends for Cyclophosphamide infusion but it is not necessary to wait for result before administering the infusion.
- Confirm that the patient has received out-patient prescription for Mesna and Ondansetron.
- Ensure prescription on PICS as detailed above, including rationalising the formulae and completing an initial authorise of the prescription.

Nursing responsibilities before the infusion is commenced.

- Ensure Cyclophosphamide is prescribed. Liaise with the Lead Pharmacist for Renal Services (bleep: 1836) or Pharmacy Aseptic Unit (x16216) if there are any problems.

- To prevent delays due to the time taken in the sterile pharmacy lab nursing staff should contact the patient 24 hours prior to the infusion to confirm that they will be attending for the infusion and that they do not have symptoms of infection. If the nurse is happy that the patient will be attending and is fit for infusion the sterile lab can be informed to make up the infusion. If there are any concerns then the sterile lab should not be contacted until the patient has been reviewed on admission by the ward nursing staff.
- Review relevant patient correspondence through Portal. The patient will have a day case PICS admission episode.
- Ensure consent form has been signed and pre-infusion checklist is completed and there are no contraindications to the patient receiving cyclophosphamide
- If the patient is pre-menopausal and it is at all possible that they may be pregnant a pregnancy test must be carried out pre infusion by registered practitioners trained to perform pregnancy testing. The result must be documented and countersigned by both practitioners witnessing the test. If a patient believes she may be pregnant but is unable to provide a urine sample due to renal disease a blood sample must be sent.
- Take and record: temperature, pulse, blood pressure, oxygen saturations (SaO_2) and respirations levels as a base line prior to each infusion.
- Perform urinalysis to exclude infection, send MSU if nitrite/leukocyte positive and inform medical staff and seek advice before proceeding with infusion. Many patients receiving Cyclophosphamide with renal involvement will have protein and blood on urine dipstick because of renal inflammation, this in itself is not a reason to defer the infusion.
- Weigh patient on each admission. Inform prescriber of weight change >1kg from most recent entry on PICS to allow dosage review.

- Ensure serum creatinine has been measured within the last 7 days. In the event that a patient's creatinine is changing rapidly and may have recently crossed the 300micromol/l threshold, a repeat sample must be sent at the physician's discretion.
- Ensure a full blood count is available from within the last 4 days (weeks 0, 2 and 4) or last 7 days (all other weeks) prior to infusion. If not available, FBC must be sent urgently and results reviewed prior to start of Cyclophosphamide.
- **If WBC < 4 x10^9/L or Neutrophils < 2 x10^9/L do not commence infusion. Inform Renal SpR or consultant.**
- **If platelet count <150 x10^9/L or Haemoglobin <80g/l, notify Renal SpR or consultant before starting infusion and confirm infusion to be commenced.**
- **If the patient has a fever, send Full Blood Count (FBC) (if not already taken on the day), full biochemical profile including CRP and blood cultures**. If the patient is not anuric, a urine sample must also be sent to microbiology for cytometry and culture.

The patient and lab results must be reviewed by medical staff before a decision is made to commence the infusion. **Patients with suspected significant infection must not receive Cyclophosphamide**.

- Inform Pharmacy Sterile Lab if patient fit for infusion if not already done so the day before.
- Ensure patient has taken pre infusion medications, Mesna and Ondansetron. Ensure patient already has medications required post infusion.
- Ensure cannula inserted.
- The Intravenous giving set must be primed with Sodium Chloride 0.9%
- The final authorisation for infusion on PICS should be signed by the nurse who has assessed the patient and has chemotherapy administration privileges on PICS.

Administration of Cyclophosphamide infusions.

All areas in which chemotherapy drugs are administered must have the following equipment readily available:

a) Emergency bell/telephone
b) Resuscitation equipment
c) Drugs for management of emergencies; cardiac arrest and anaphylaxis
d) Extravasation kit
e) Cytotoxic spillage kit
f) Access to running water
g) Disposal equipment e.g. appropriate sharps bins
h) Copies of relevant policies and procedures

Cyclophosphamide infusions must be checked and administered in line with: UHB NHS Foundation Trust Procedure for the Safe Prescribing, Handling and Administration of Cytotoxic and other Chemotherapeutic Agents (Controlled document number 504 current version), http://uhbpolicies/assets/EppCytotoxicDrugAdministrationRn.pdf and Procedure for the Prescribing, Supply, Dispensing, Handling, Storage, Administration and Disposal of Medicines including Controlled Drugs (Controlled Document Number 443, Current Version http://uhbpolicies/assets/MedicinesCode.pdf)

- One practitioner must be competent in the administration of Chemotherapy Infusions as per Trust Expanded Practice Protocol for the Administration of Intravenous Cytotoxic Drugs by Registered Nurses (Controlled Document Number:249.5 Current version)http://uhbpolicies/assets/EppCytotoxicDrugAdministrationRn.pdf

- The second, checking practitioner must be an intravenous competent registered nurse as per Trust Expanded Practice Protocol for the Administration of Intravenous Drugs and Infusions by Registered Practitioners (Controlled Document Number: 232. Current version)http://uhbpolicies/assets/EppIvDrugsAdministrationRp.pdf

Registered nurses not competent in the administration of Intravenous Cytotoxic Drugs as per Trust Expanded Practice Protocol for the Administration of Anti Systemic Cancer Therapy must not administer Cyclophosphamide infusions.

Spillage and waste must be dealt with in accordance with:
UHB NHS Foundation Trust Procedure for the Safe Prescribing, Handling and Administration of Cytotoxic and other Chemotherapeutic Agents (Controlled document number 504 current version)
http://uhbpolicies/assets/EppCytotoxicDrugAdministrationRn.pdf

Clinical Observations for Infusions.

The need for frequent observations must be assessed by the registered practitioner caring for the patient based on the patient's clinical condition. No specific observations are required during administration of Cyclophosphamide infusions, however blood pressure, heart rate, SaO2, temperature and respirations must be taken and recorded as a minimum on admission and post infusion.

Administration must not commence or must STOP if:
a) The patient requests the treatment to stop.
b) There is any doubt regarding the
    i) stability of the drug (i.e. possible incorrect storage or precipitation),
    ii) expiry of the infusion,
    iii) drug dosage,
    iv) pre-treatment investigations or
c) The environment in which treatment is being administered is deemed unsafe.
d) The patient demonstrates side effects or complications, particularly signs of hypersensitivity reaction or anaphylaxis.
e) The equipment fails to function effectively.
f) There is any doubt regarding the integrity of the venous access device being used.

Managing Infusion reactions.

Any reactions must be managed as per:

- Trust anaphylactic procedure
- Pan Birmingham Cancer Network Guidelines for the Management of Extravasation

Inform Renal SpR or Consultant.

Post infusion

- Giving sets must be flushed on completion of infusion with 0.9% Sodium Chloride.
- Post infusion observations.
- Remove cannula.
- Ensure all waste is disposed of correctly e.g. correct sharps bin.
- Ensure patient has completed discharge leaflet with post infusion drug advice, contact numbers and date for post-infusion monitoring blood tests.
- Inform patient of next infusion date or follow up appointment as required.
- Once all above is complete patient may be discharged.
- Ensure all components of regime have been signed for (including any drug not given) on PICS and Cyclophosphamide infusion is finished on PICS, not doing so will prevent next infusion being prescribed.

Patient ID label

Planned Treatment Schedule

Infusion number	Week	Date	Revised dates if infusion postponed
1	0		
2	2		
3	4		
4	7		
5	10		
6	13		
	Further infusion dates if required by consultant		
7	16		
8	19		
9	22		
10	25		

ADMINISTRATION CHECKLIST

Patient Name/ID label:…….. Unit No:……. Date ……..

Patient's weight: **Kg**		**Dose of Cyclophosphamide**		**Infusion number**
Inform medical staff if weight more than 1Kg different from most recent weight				

Current Health Status/relevant PMH.

	All criteria must be met for infusion to take place.	
Is/could the patient be pregnant?	Yes/**No**	If yes do not give infusion. See guidance under nurses responsibilities*. Inform medical staff.
History of recent fever, cough, worsening dyspnoea, dysuria, dental abscess or any other infection. Recent increase in CRP	Yes/**No**	If yes, check severity & whether on antibiotics. Medical staff to review and confirm whether infusion is to be commenced.
History of exposure to chicken pox or shingles within 20 days	Yes/**No**	If yes discuss with medical staff.
Baseline observations within normal parameters	**Yes**/No	If no discuss with medical staff
Appropriate FBC available (see nursing responsibilities on page 5) Wcc >4.0 $x10^9$/L, Neut >2.0 $x10^9$/L, Plat >150 $x10^9$/L	**Yes**/No	If no bloods available, obtain and send urgently. If not within normal parameters inform medical staff.
Has serum creatinine passed 300 µmol/L threshold in past 7 days	Yes/**No**	If yes discuss with Consultant as dose may need to be adjusted
If patient not anuric, urinalysis negative nitrites/leukocytes	**Yes**/No	If nitrite positive send MSU, inform Consultant/Registrar and do not proceed with infusion without permission. Leukocyte positive only send MSU and proceed if asymptomatic
Patient has negative Hepatitis B/C/HIV Screen at baseline	**Yes**/No	If no result available, obtain verbal consent and send Hepatitis B/C and HIV sample and proceed with infusion. If positive result do not proceed and discuss with Consultant.
Patient has taken pre-infusion Mesna and Ondansetron	**Yes**/No	If no, ensure administered pre infusion.

On completion of checklist any contraindications or active medical problems must be documented below. Advice must be sought from medical staff before infusion.

Date/Time		**Signature**

University Hospitals Birmingham NHS
NHS Foundation Trust

Patient Name/ID label:…… Date:……..

You have received an infusion of Cyclophosphamide today.

Please take your post-infusion Mesna (bladder protection tablet):

- 1st dose: 2 hours from the start of the infusion at:……
- 2nd dose: 6 hours from start of the infusion at:…… or at bedtime (whichever is sooner).

Your next dose of Ondansetron (anti-sickness tablet) is due at:.....

You should continue to take Prednisolone tablets and Co-Trimoxazole whilst you are receiving Cyclophosphamide treatment as directed by your medical team.

If you experience any fever, or other symptoms of infection or feel unwell following your infusion it is important that you contact us. You may need to be seen by a Doctor and have blood tests taken and may require admission to hospital. Do not delay seeking advice. Please contact us urgently on:

- Kidney Assessment Team on 0121 371 3017 or 07766500092 (8am-7pm Mon-Friday, 8am-3pm Sat/Sun/Bank holidays),
- or Sarah Logan, Clinical Nurse Specialist on 0121 627 2518 or 07827232646 Monday to Friday 8.15-4.15
- Outside of these hours and in an emergency contact the On Call Renal Registrar (available 24 hours a day) via main hospital switchboard 0121 371 2000.
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It is very important that you have a blood test in 10 days time, which will be taken at ..... on .....If you have problems attending or booking your blood test contact Sarah Logan on 0121 627 2518. You will/will not require a further blood test before your next infusion on .....

Your next infusion is due: Date:…… Time.....

Place: Renal Infusion Suite, 1st Floor,, Old Queen Elizabeth Hospital, Birmingham

<u>Please remember to take Ondansetron and Mesna on the day of your next infusion 2 hours before your appointment time.</u>

Discharging Nurse

Name:……Designation:…….